



SCIENCE

Programmatic Status

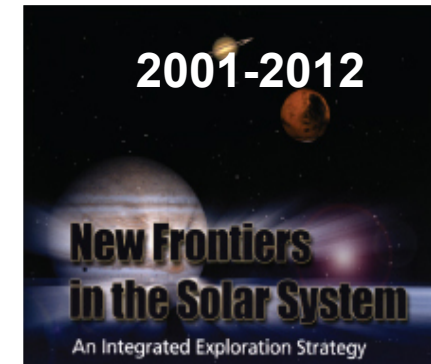
Curt Niebur
NASA Headquarters
Europa Plume Advisory Meeting
June 1, 2014



A Little Recent History - Europa and the Decadal Survey



- The Decadal Survey provided 5 science goals for Europa exploration
 1. Characterize the ocean
 2. Characterize the ice shell and the surface-ice-ocean exchange
 3. Determine global composition and chemistry, especially with regard to habitability
 4. Understand the surface features and geology (and locate landing sites for future exploration)
 5. Understand the space environment
- The Decadal Survey considered a comprehensive mission concept called the Jupiter Europa Orbiter (JEO)
 - NRC's independent Cost And Technical Estimate (CATE) for JEO deemed it unaffordable at \$4.7B, and therefore it was the “second highest priority Flagship mission” based on “pragmatic reasons associated with the spending profiles”



“NASA should immediately undertake an effort to find major cost reduction for JEO”



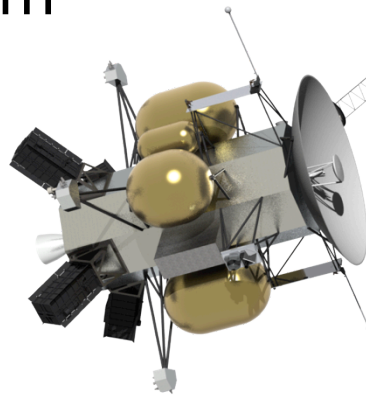
Options for Reduced Cost Europa Missions



- The year following the Decadal Survey was spent executing the recommendation to find major cost reductions
 - The highly capable but complex JEO concept was split into three far simpler elements
 - These three mission concepts were independent, stand alone missions each with its own meritorious science
- The purpose of this effort was to define and validate a set of minimum concepts that demonstrate missions exist at the lower end of the cost spectrum (~\$2B) that still provide significant science return



Multiple-Flyby in Jupiter Orbit



Europa Orbiter



Europa Lander



Congressional Direction in FY14 Appropriation



- Congress has substantially supported a Europa mission in both FY13 and FY14 appropriations allowing NASA to conduct pre-formulation studies
- FY14 appropriation directed “*That \$80,000,000 shall be for pre-formulation and/or formulation activities for a mission that meets the science goals outlined for the Jupiter Europa mission in the most recent planetary science decadal survey,*” with additional information provided in the House report



NASA Activities Moving Forward

- Continue Europa Clipper mission pre-formulation and technology development work
- Release a RFI to collect ideas on a <\$1B Europa mission
 - Potential to collect intriguing RFI responses meriting further study
- Identify mission architectures in the \$1B-\$2B range and assess expected science return
- Release competitive instrument AO for Phase A risk reduction
 - This would address the long standing and long lead risk identified by all previous Europa mission studies and independent reviews
- Study various launch vehicle options including SLS

All of these activities need to be complete before any decision is made by NASA to proceed with a mission

EUROPA EXPLORATION

